Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for dynamically controlling of a multiple actuator-sensor smart matter dynamic control system, comprising:

predicting future behavior of the multiple actuator-sensor smart matter dynamic control system using a plurality of control system models;

determining at least one control system model which is more successful than at least one other model of the plurality of models in predicting the future behavior of the multiple actuator-sensor smart matter dynamic control system;

increasing a weight of the at least one more successful control system model in the plurality of control system models used to predict future behavior of the multiple actuator-sensor smart matter dynamic control system relative to ~~the weight~~a weight of the at least one other model; and

using the at least one more successful control system model with the increased weight to control the multiple actuator-sensor smart matter dynamic control system.

2. (Original) The method of claim 1, wherein the plurality of control system models comprises N control system models and each of the N control system models is initially assigned a weight w_i such that

$$\sum_{i=1}^{N} w_i = 1 .$$

3. (Currently Amended) The method of claim 2, wherein using ~~an i^{th} model~~ a plurality of control system models includes defining an investing ~~a certain~~ fraction a_i of ~~the weight~~a weight w_i of ~~the i^{th}~~ an i^{th} model, where $0 < a_i < 1$.

4. (Currently Amended) The method of claim 3, wherein each model is used to predict, at a current time t, a future state of the multiple actuator-sensor smart matter dynamic control system at a later time (t+Δt):

$$\cancel{x_i(t+\Delta;x(t),u(t))}$$

$$\underline{x_i(t+\Delta t;x(t),u(t)),}$$

where x(t) is a state of the multiple actuator-sensor smart matter dynamic control system at time t, $x_i(t+\Delta t)$ is a state of the multiple actuator-sensor smart matter dynamic control system at time t+Δt estimated by the i^{th} model, and u(t) is a control input at time t.

5. (Currently Amended) The method of claim 4, ~~wherein the invested amount is split between the N models~~further comprising assigning a new weight W_i^{new} for the i^{th} model according to the formula

$$\cancel{w_i^{new}=(1-a)w_i^{old}+a}\left[\frac{1/(e_i^2+\sigma^2)}{\sum_{j=1}^{N}1/(e_j^2+\sigma^2)}\right]$$

$$\underline{w_i^{new}=(1-a_i)w_i^{old}+a_i\left[\frac{1/(e_i^2+\sigma^2)}{\sum_{j=1}^{N}1/(e_j^2+\sigma^2)}\right],}$$

wherein w_i^{old} is a previous weight for the i^{th} model, e_i is a prediction error of the i^{th} model, and σ^2 is a noise variance of the multiple actuator-sensor smart matter dynamic control system.

6. (Currently Amended) The method of claim 1, further including repeating the predicting, determining and increasing steps within one or more selectable time periods.

7. (Currently Amended) The method of claim 1, further including ~~the sum of~~summing prediction error over a finite ~~interval~~interval.

8. (Currently Amended) The method of claim 1, ~~including the actuation and the error to weight~~further comprising adding new models.

9. (Currently Amended) A dynamical controller of a multiple actuator-sensor smart matter dynamical control system, comprising:

means ~~to predict~~for predicting a future behavior of a multiple actuator-sensor smart matter dynamical control system using a plurality of control system models;

means ~~determining~~ for determining at least one control system model which is more successful than other models in the plurality of models in predicting future behavior of the multiple actuator-sensor smart matter dynamical control system;

means ~~increasing the~~for increasing a weight of the at least one more successful control system model in the plurality of control system models used to predict future behavior of the multiple actuator-sensor smart matter dynamical control system; and

means ~~using~~ for using the at least one more successful control system model to control the multiple actuator-sensor smart matter dynamical control system.

10. (Currently Amended) The controller of claim 9, wherein the plurality of control system models comprises N control system models, and each of the N control system models is initially assigned a weight w_i such that

$$\sum_{i=1}^{N} w_i = 1.$$

11. (Currently Amended) The controller of claim 9, wherein ~~using an i_{th} model includes~~the means for predicting a further behavior defines an investing ~~a certain~~ fraction a_i of ~~the weight~~a weight w_i of ~~the i^{th}~~ an i^{th} model, where $0 < a_i < 1$.

12. (Currently Amended) The controller of claim 11, wherein each model is used to predict, at a current time t, a future state of the multiple actuator-sensor smart matter dynamical control system at a later time (t + Δt):

$$\cancel{x_i\left(t+\Delta; x(t), u(t)\right).}$$

$$\underline{x_i\left(t+\Delta t; x(t), u(t)\right),}$$

where $x(t)$ is a state of the multiple actuator-sensor smart matter dynamic control system at time t, $x_i(t+\Delta t)$ is a state of the multiple actuator-sensor smart matter dynamic control system at time $t+\Delta t$ estimated by the i^{th} model, and $u(t)$ is a control input at time t.

13. (Currently Amended) The controller of claim 11, wherein the ~~invested amount is split between the models~~means for increasing a weight assigns a new weight w_i^{new} for the i^{th} model according to the formula

$$\cancel{w_i^{new} = (1-a)w_i^{old} + a}\left[\frac{1/\left(e_i^2+\sigma^2\right)}{\sum_{j=1}^{N} 1/\left(e_j^2+\sigma^2\right)}\right]$$

$$\underline{w_i^{new} = (1-a_i)w_i^{old} + a_i\left[\frac{1/\left(e_i^2+\sigma^2\right)}{\sum_{j=1}^{N} 1/\left(e_j^2+\sigma^2\right)}\right],}$$

wherein w_i^{old} is a previous weight for the i^{th} model, e_i is a prediction error of the i^{th} model, and σ^2 is a noise variance of the multiple actuator-sensor smart matter dynamic control system.

14. (Currently Amended) A dynamical controller of a multiple actuator-sensor smart matter dynamical control system, comprising:

a prediction circuit usable to predict a future behavior of the multiple actuator-sensor smart matter dynamical control system using a plurality of control system models;

a success determination circuit usable to determine at least one control system model which is more successful than at least one other model in the plurality of models in predicting the future behavior of the multiple actuator-sensor smart matter dynamical control system;

a weight increasing circuit usable to increase ~~the weight~~a weight of the at least one more successful control system model relative to the at least one other model; and

a controller that uses at least the at least one more successful control system models to control the multiple actuator-sensor smart matter dynamical control system.

15. (Currently Amended) The controller of claim 14, wherein the plurality of control system models comprises N control system models,~~;~~ and each of the N control system models is initially assigned a weight w_i such that

$$\sum_{i=1}^{N} w_i = 1.$$

16. (Currently Amended) The controller of claim 14, wherein ~~using an i^{th} model includes~~the prediction circuit defines an investing ~~a certain~~ fraction a_i of ~~the~~ a weight w_i of ~~the~~ an i^{th} model, ~~where,~~where $0 < a_i < 1$.

17. (Currently Amended) The controller of claim 14, wherein each model is used to predict, at a current time t, a future state of the multiple actuator-sensor smart matter dynamical control system at a later time (t+Δt):

$$\cancel{x_i(t+\Delta; x(t), u(t))}$$

$$\underline{x_i(t+\Delta t; x(t), u(t)),}$$

where x(t) is a state of the multiple actuator-sensor smart matter dynamic control system at time t, x_i(t+Δt) is a state of the multiple actuator-sensor smart matter dynamic control system at time t+Δt estimated by the i^{th} model, and u(t) is a control input at time t.

18. (Currently Amended) The controller of claim 16, wherein the ~~invested amount is split between the models~~weight increasing circuit assigns a new weight w_i^{new} for the i^{th} model according to the formula

$$\cancel{w_i^{new} = (1-a)\, w_i^{old} + a \left[\frac{1/\left(e_i^2 + \sigma^2\right)}{\sum_{j=1}^{N} 1/\left(e_j^2 + \sigma^2\right)} \right]}$$

$$\underline{w_i^{new} = (1-a_i)\, w_i^{old} + a_i \left[\frac{1/\left(e_i^2 + \sigma^2\right)}{\sum_{j=1}^{N} 1/\left(e_j^2 + \sigma^2\right)} \right]},$$

wherein w_i^{old} is a previous weight for the i^{th} model, e_i is a prediction error of the i^{th} model, and σ^2 is a noise variance of the multiple actuator-sensor smart matter dynamic control system.